Amendments to the Drawings:

The attached two sheets of drawings include changes to Figs. 2 and 3. These sheets, which include Figs. 2 and 3, replace the original sheets including Figs. 2 and 3.

Attachment: Replacement Sheets

REMARKS

The office action of August 24, 2004, has been carefully considered.

It is noted that the specification and drawings are objected to on formal grounds.

Claims 4 and 12 are rejected under 35 U.S.C. 112, second paragraph.

Claims 1-22 are rejected under 35 U.S.C. 103(a) over the document of Howe et al. in view of the patent to Dai et al.

In connection with the Examiner's objection to the specification, applicant has amended the specification to include section headings to provide generic terminology for the trademarks mentioned in the specification.

Relative to the drawings, applicant has attached hereto replacement sheets containing Figs. 2 and 3 which remove reference to prior art. Figs. 2-4 are part of an illustration of an embodiment of the invention comprising Figs. 2-11.

In view of these considerations it is respectfully submitted that the objections to the specification and drawings are overcome and should be withdrawn.

In view of the Examiner's rejections of the claims, applicant has amended claims 1, 3-5, 7-9, 11, 12, 14-16, 18-20 and 22.

It is respectfully submitted that the claims now on file particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claim 4 to address the points raised by the Examiner. Regarding the "standard ductwork" recited in claim 12, this term is defined in the specification at page 10, lines 9-12, as the components required to build the ducting system. Applicant does not see where there is any ambiguity as to the scope of the term as used in the claim.

In view of these considerations it is respectfully submitted that the rejection of claims 4 and 12 under 35 U.S.C. 112, second paragraph is overcome and should be withdrawn.

With respect to the Examiner's statements in paragraph 7 of

the Office Action, according to which the invention's software design features are considered as flexible to any procedure or series of steps to fabricate any commercial structure while adhering to industry design specification standards, applicant submits that this interpretation is too broad. Amended claims 1 and 12 clearly refer to the automation of the design of a ducting system, which is made clear by a number of features contained in the claims (namely, identifying boundary conditions of the ducting system, component terminal connection through which fluid is exchanged with the ducting system, identification of all required ducting components for building a ducting system, etc.). Furthermore, the Examiner's interpretation of the term "drop tube" as a z-direction base or start tube correctly reflects the meaning of the term as used on page 5, lines 5-8 of the application.

It is respectfully submitted that the claims presently on file differ essentially and in an unobvious, highly advantageous manner from the constructions disclosed in the references.

Turning now to the references, and particularly to the patent to Dai et al. it can be seen that this patent discloses a method for designing an integrated inlet duct for a marine vehicle hull that enables sufficient transmission of a substantially

gravitation free fluid flow over the operating speed range of the marine vehicle. This is considered a multi-point design problem requiring close coupling between hydrodynamic design and geometric design of the inlet duct, and requires evaluating inlet flow at both design and off-design speeds (see col. 6, lines 18-22 of Dai et al.). The method according to Dai et al. therefore comprises the steps of entering boundary data identifying boundary conditions of the ducting system into a data processing system, which boundary data comprise the design speed of the marine vehicle (col. 6, line 19) and the shape of the inlet exit 25 of the inlet duct, which remains fixed in the design process (col. 8, lines 23-24). Further, the method according to Dai et al. determines design data by applying an optimization algorithm to said boundary data using said data processing system, which design data comprises five variable design parameters, namely (1) shape of the inlet opening 23; (2) inlet duct inclination angle 28; (3) length of the integrated inlet duct 20 from inlet plane to exit plane; (4) aspect ratio of inlet to exit; and (5) local geometric refinement of the filet 29 (col. 8, lines 27-33). Furthermore, the data processing system communicates the design data to an external recipient.

The method according to Dai et al. does not, however, teach

the subject matter contained in claim 1 beginning at line 11, and in claim 12 beginning at line 8. According to the claims presently on file the boundary data comprises positional information in the three dimensional installation space and magnitude of partial fluid for flow for at least one component terminal connection, through which fluid is exchanged with the ducting system, and positional information in the three dimensional installation space of at least one main terminal connection, through which the total fluid flowing through the at least one component terminal connection is routed, and in that said optimum layout includes an identification of all required ducting components for building the ducting system, selected from a collection of standard ductwork primitives.

The inlet exit 25 and the inlet opening 23 according to Dai et al. can be considered to represent the component terminal connection and the main terminal connection. If the position of one of the duct ends is considered to be fixed in the design space, the other end needs to be kept variable, as according to col. 8, lines 27-30, the inlet duct inclination angle 28 and the length of the integrated inlet duct 20 are defined as variable design parameters determined by the design method. Therefore, both ends of the inlet duct cannot be given as boundary data to remain

fixed in the design process. Further, the magnitude of partial fluid flow for either the inlet exit 25 or the inlet opening 23 is not given as boundary data. In addition to that, the surface geometry data according to Dai et al. does not include an added indication of required ducting components for building a ducting system, selected from a collection of standard ductwork primitives. The inlet duct according to Dai et al. instead has to be custom fabricated according to the specific geometry determined and cannot be assembled from standard ductwork primitives, as in the presently claimed invention.

The Howe et al. document refers to a design system for designing geometric structures, such as buildings by assembling the structure from parametric primitives. According to this document the user is allowed to assemble components from "component libraries" located on the Internet in order to assemble them into a virtual representation of a building. The design system does therefore not relate to a method for automating the design of a ducting system for a fluid. Therefore, no boundary data comprising positional information and magnitude of partial fluid flow for component terminal connections, through which fluid is exchanged, is therefore disclosed by Howe et al. Furthermore, no optimization algorithm is used in the Howe document. The design

system is rather merely configured to provide the user with a large range of components to be assembled by the user in a "manual process". Thus, Howe et al. do not teach the invention as recited in the claims presently on file.

The Examiner combined these references in determining that claims 1-22 would be unpatentable over such a combination. Applicant respectfully submits that neither of these references, nor their combination, teach the invention recited in the claims now on file.

Dai et al. is considered the closest prior art since this reference also refers to a method for automating the design of a ducting system for a fluid. As previously discussed, the method of Dai et al. is geared toward the design of an inlet duct for guiding fluid entering a marine vehicle. In order to optimize the dynamics of the fluid flow depending on the target speed of the marine vehicle, the length and the inclination angle of the inlet duct remains a variable to be determined by the design method. Therefore, the method according to Dai et al. has a drawback in that it is not suitable to be used in the heating and ventilation industry. That means it is not suitable to be used in the design and the logistics of installation of exhaust air, fresh-air

ducting and air-conditioning ducting. In this field it is desirable to obtain a design method able to design a complete ducting system in a given three-dimensional installation space.

The present invention has the object of providing a method for automating the design of a ducting system suitable for the heating and ventilation industry, which allows the design for a complete ducting system in a given three-dimensional installation space.

This object is achieved by the present invention by identifying boundary conditions which comprise complete positional information in a three-dimensional installation space for each of at least one component terminal connection and at least one main terminal connection as well as a magnitude of partial fluid flow. The automation of the design is further enhanced by the identification of all required ducting components for building the ducting system selected from a collection of standard ductwork primitives.

The invention is not obvious from the prior art of Dai et al. since the Dai et al. method is geared towards an inlet duct for marine vehicles; due to the requirements to keep the inlet duct

inclination angle and the length of the integrated inlet duct a variable to be determined by the design system, this method cannot make it obvious to fix the positions of both ends of a ducting system, namely the component terminal connection and the main terminal connection. Further, the magnitude of the fluid entering the inlet duct is not critical parameter according to Dai et al.; the design of an inlet duct of a marine vehicle is rather influenced by the dynamics of the fluid entering the inlet duct, which is determined by the target speed of the marine vehicle. Still further, the geometry of the inlet duct determined by the method according to Dai et al. is too complex to be assembled by standard ductwork primitives. Therefore, the provision of an identification of required ducting components selected from standard ductwork is not made obvious by Dai et al.

The teachings of Howe et al. do not relate at all to the design of a ducting system and thus one skilled in the art of designing ducting systems would not look to the teachings of Howe et al. However, even if the references are combinable the combination does not teach the invention recited in the claims presently on file. There is no teaching of providing a magnitude of partial fluid flow for each of at least one component terminal connection to be entered as boundary data, as in the present

invention.

In view of these considerations it is respectfully submitted that the rejection of claims 1-22 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome and should be withdrawn.

Reconsideration and allowance of the present application are respectfully requested.

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

By

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450 Alexandria, VA 22313-1450, on November 24, 2004

By: Klaus P. Stoffel

Date: November 24, 2004